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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,388	01/15/2004	Takeshi Kobayashi	61282-055	4950
7590 11/30/2005 McDERMOTT, WILL & EMERY 600 13th Street, N.W. Washington, DC 20005-3096			EXAMINER NGUYEN, DILINH P	
			ART UNIT 2814	PAPER NUMBER

DATE MAILED: 11/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/757,388	KOBAYASHI ET AL.	
	Examiner	Art Unit	
	DiLinh Nguyen	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5, 19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 19 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10/27/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claim 19 is objected to because of the following informalities:

Line 5, claim 19, replace "the reverse face of the lead" with –the reverse face of the multi-layer lead--.

The phrase: "wherein a portion of the reverse face of the lead protrudes from a principal plane of the piece of sealing resin" renders the claim indefinite.

The lead now is a multi-layer lead and it is not clear how a portion of the reverse face of the lead protrudes from a principal plane of the piece of sealing resin? Does the applicant mean that all the layers of the multi-layer lead protrudes from a principal plane of the piece of sealing resin?

Last line, claim 19, replace "the lead" with –the multi-layer lead--.

The phrase: "the lead is a thin film formed from the outer face side to the inner face side" renders the claim indefinite.

The lead now is a multi-layer lead and it is not clear where is a thin film formed from the outer face side to the inner face side?

Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3 and 19-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Kweon et al. (U.S. Pat. 5900676).

Kweon et al. disclose a lead frame comprising:

a lead frame body 40 (fig. 4) comprising a sheet shaped body made of metal (column 5, lines 41-42);

a groove portion 24a (fig. 11) for forming a lead which is formed by a predetermined depth in a lead forming region of a surface of the lead frame body; and

a lead 24 (fig. 11) having a portion which protrudes from the groove portion laterally onto the surface of the lead frame body, the lead being made of material different from material of the lead frame body (column 5, lines 15-18).

- Regarding claim 2, Kweon et al. disclose that the lead including: a first conductor layer 150 formed in the groove portion, a second conductor layer 24 formed on the first conductor layer; and a third conductor layer 40 formed on the second conductor layer, wherein: the first conductor layer is assembled to an assembling member, and the third conductor layer 40 is assembled to a bonding pad of a semiconductor chip 110 (cover fig., column 7, lines 6-10).
- Regarding claim 3, Kweon et al. disclose that the first conductor layer covers an entire inner wall of the groove portion (cover fig. and fig. 11).
- Regarding claim 19, in-so-far as clear, Kweon et al. disclose a semiconductor device comprising:
a semiconductor chip 110;
a multi-layer lead (layers 40, 24 and 150) connected to the semiconductor chip

and having a first conductor layer 150; and

a piece of sealing resin 140, wherein a portion of the reverse face of the lead protrudes from a principal plane of the piece of sealing resin, the first conductor layer 150 covering an entire surface of the portion, and the multi-layer lead (layers 40, 24 and 150) wherein layer 150 is a thin film (cover fig.).

- Regarding claim 20, Kweon et al. disclose that the multi-layer lead further including: a second conductor layer 24 laminated inside the first conductor layer; and a third conductor layer 40 formed inside the second conductor layer, wherein an entire surface of the lead, which is exposed from the sealing resin, is covered with the first conductor layer (cover fig.).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kweon et al. (U.S. Pat. 5900676) in view of Cutting et al. (U.S. Pat. 6759597).

Kweon et al. substantially disclose all the limitations as claimed above except for a barrier layer for suppressing a reaction between the lead frame body and the first conductor layer, the barrier layer being provided between the first conductor layer and the groove portion.

However, Cutting et al. disclose a semiconductor device comprising: a nickel layer provides a satisfactory diffusion barrier between the copper layer and the gold layer. Therefore, it would have been obvious to one having ordinary in the art at the time the invention was made to modify the device structure of Kweon et al. by having a barrier layer between the lead frame body and the first conductor layer, the barrier layer being provided between the first conductor layer and the groove portion because as taught by Cutting et al., such the barrier layer would prevent the formation of copper gold intermetallic alloys between the copper layer and the gold layer (column 1, lines 24-27).

Response to Arguments

Applicant's arguments filed 9/12/05 have been fully considered but they are not persuasive.

- The applicant argues that the lead 24 of Kweon et al. merely protrudes vertically from the alleged groove portion without any lateral portion.

The arguments have been fully considered but they are not persuasive because the lead 24 of Kweon et al. clearly having a portion which protrudes from the groove portion laterally onto the surface of the lead frame body 40 (fig. 11, column 5, lines 15-18).

- The applicant argues that Kweon et al. fail to disclose the first conductor layer covering an entire surface of the portion.

The arguments have been fully considered but they are not persuasive because claim 19 recites that a portion of the reverse face of the lead protrudes from a principal plane of the piece of sealing resin, the first conductor layer covering an entire surface of

said portion. Kweon et al. clearly disclose that a piece of sealing resin 140, wherein a portion of the reverse face (the face adjacent to the layer 150) of the lead 24 protrudes from a principal plane of the piece of sealing resin 140, the first conductor layer 150 covering an entire surface of the portion (cover fig.).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (571) 272-1712. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DLN

A handwritten signature in black ink, appearing to read 'Hoai Pham', with a stylized, flowing script.

HOAI PHAM
PRIMARY EXAMINER